PATENT
Docket No. H 3172A-PCT/US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Application of Heck, et al.

Serial No. 09/880,695 Examiner: Elvis O. Price
Filed: 06/12/01 Art Unit: 1621
TITLE: UNSATURATED PALM OIL FATTY ALCOHOLS

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Appellants' appeal brief, in triplicate, is transmitted herewith in accordance with 37 CFR 1.192.

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Respectfully submitted,

July 18, 2003
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BY: Rose A. Stowe DATE: July 18, 2003
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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re:	Patent Application of Stephan Heck, *et al.*	: Group Art Unit: 1621
Appln. No.:	09/880,695	: Examiner: Elvis O. Price
Filed:	June 12, 2001	: Confirmation No: 6462
For:	UNSATURATED PALM OIL FATTY ALCOHOLS	: Attorney Docket No.: **H 3172A PCT/US**

APPELLANTS' BRIEF ON APPEAL UNDER 37 C.F.R. §1.192

Pursuant to the Notice of Appeal filed on March 18, 2003, via facsimile, and received by the U.S. Patent & Trademark Office on the same date, Appellants submit herewith a Brief On Appeal under 37 C.F.R. §1.192, appealing the Examiner's final rejection of pending claim 3, as set forth in the final Office Action dated September 18, 2002 (Paper No. 11), as maintained in the Advisory Action dated April 22, 2003 (Paper No. 14). This Brief On Appeal is being timely filed as a Petition for a two-month extension of time, up to and including July 18, 2003, including an authorization to charge fees, is being submitted herewith.

Appellants respectfully request consideration by the honorable Board of Patent Appeals and Interferences and reversal of the Examiner's rejection based on the arguments set forth in the attached brief.

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REAL PARTY IN INTEREST

The real party in interest in the instant appeal is Cognis Deutschland GmbH & Co. KG, a German company having a place of business at Henkelstraße 67, 40589 Düsseldorf, Germany.

RELATED APPEALS AND INTERFERENCES

Appellants are aware of the appeal in co-pending U.S. patent application serial number 09/874,899, pending before Examiner Price in Group Art Unit 1621, which may directly affect or may be directly affected by or may have a bearing on the Board's decision in the instant appeal. Appellants are not aware of any other related appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the instant appeal.

STATUS OF THE CLAIMS

Claims 3 and 4 are pending in the instant application on appeal. The Examiner has indicated that claim 4 is allowable. Claim 3 is the subject of the instant appeal.

Claim 3 stands finally rejected under 35 U.S.C. §103(a), as being unpatentable over U.S. Patent No. 5,672,781 of Koehler, *et al.*, (hereinafter referred to as "Koehler"), for the reasons of record set forth in Paper No. 11, Paper No. 14 and the Office Action dated January 16, 2002 (Paper No. 7).

STATUS OF AMENDMENTS

No amendments have been filed in the instant application on appeal subsequent to the Examiner's final rejection of claim 3. Appellants' Request for Reconsideration After Final, filed on March 18, 2003 ("the Request for Reconsideration After Final"), has been considered but was not deemed to place the instant application in a condition for allowance, as indicated in Paper No. 14. An appendix containing a copy of the claims involved in the appeal, in accordance with 37 C.F.R. §1.192(c)(9), is attached as Appendix A.

SUMMARY OF THE INVENTION

Appellants have discovered a simplified process for preparing mixtures of fatty alcohols with desirable properties. Appellants' claimed invention is directed, on one hand, to the simplified process itself, and on the other hand, to the novel and unobvious products of the inventive process. The simplified process allows for the production of vegetable-based, unsaturated fatty alcohol mixtures which have properties and characteristics suitable for use in a variety of cosmetic products. (*See, e.g.,* Appellants' Spec., p. 3, lines 26-33 & p. 4, lines 13-23). Fatty alcohols with such properties and characteristics had previously been derived in large part from animal fats, however animal-based fatty alcohols are no longer widely accepted by many consumers. (*See, e.g.,* Appellants' Spec., p. 2, lines 1-10 & 24-26) The mixtures of fatty alcohols produced by the process according to one embodiment of the present invention exhibit very desirable iodine values and a preferred alkyl chain *distribution* of predominantly C_{16}/C_{18} alcohols. (*See, e.g.,* Appellants' Spec., p. 4, lines 13-23 & Example). Moreover, the mixtures of fatty alcohols also have good color and oxidation stability, excellent low-temperature behavior and are virtually odorless. (*See, id.*). The claimed range of iodine values indicate a degree of ethylenic unsaturation which in turn provides a favorable solidification point for cosmetic products. (*See, e.g.,* Appellants' Spec., p. 2, lines 1-5).

To be more specific, one embodiment of Appellants' claimed invention is directed to a process for the preparation of a mixture of fatty alcohols having an iodine number in the range from 65 to 85 and the formula, R^1OH, wherein R^1 is a saturated or unsaturated, linear or branched radical having from 14 to 20 carbon atoms. The process comprises two steps. In an initial step (a), palm oil fatty acid methyl esters are fractionated to produce a first methyl ester fraction comprised substantially of saturated C_{16} esters and a bottom product which is a second methyl ester fraction comprised substantially of unsaturated $C_{16/18}$ esters. In a second step (b), the bottom fraction is hydrogenated to give the corresponding alcohols under conditions such that the carbon-carbon double bonds remain intact. (*See,* claim 4).

Another embodiment of Appellants' claimed invention is directed to *a mixture of fatty alcohols prepared by the process according to the previously described embodiment.* (*See,*

claim 3). Appellants' have surprisingly discovered that vegetable-based fatty alcohol mixtures which have iodine values in the range from 65 to 85 and which have good color and oxidation stability, excellent low-temperature behavior and are virtually odorless, can be prepared by the process according to the present invention. (*See, e.g.,* Appellants' Spec., p. 4, lines 13-23).

Prior art fatty alcohol mixtures and processes for preparing the same, including that which is described the allegedly obviating reference cited by the Examiner, fail to teach fatty alcohol mixtures with both the claimed iodine values and the resulting alkyl chain distribution. As acknowledged by the Examiner in Paper No. 11, the prior art fails to teach the claimed process *per se*. Each separation step in the processing of fatty compounds, including for example, fractionation and distillation, can alter the spectrum of fatty alkyl chains present in the resulting product. In other words, different processes produce different products, especially when dealing with natural mixtures such as vegetable oils and animal fats.

Appellants are able to prepare vegetable-based, fatty alcohol mixtures having the claimed iodine values, and which exhibit good color and oxidation stability, excellent low-temperature behavior and are virtually odorless, via the novel and unobvious process described above and claimed in the instant application on appeal. It is by way of the materials and process steps employed in the claimed process that the novel and unobvious fatty alcohol mixtures of the present invention can be obtained.

ISSUES

(1) Is the Koehler reference, which fails to teach or suggest the claimed process and which fails to teach or suggest the mixtures of fatty alcohols which result from such a process, insufficient to establish a *prima facie* case of obviousness with respect to the product of the claimed process?

(2) Even if the Koehler reference could arguably be held to provide a rationale tending to show that Appellants' claimed product appears to be the same or similar to that of the prior art, have Appellants' provided sufficient rebuttal showing that the claimed product is different from the prior art?

GROUPING OF THE CLAIMS

Claim 3 is the subject of the instant appeal. Claim 4 stands allowed. No other claims are pending. For the purposes of the instant appeal, claim 3 stands alone.

ARGUMENT

I. *The Examiner's Rejection Under 35 U.S.C. §103(a) is Improper*

A. *The Rejection of Claim 3 Over Koehler*

In Paper No. 11, the Examiner maintained the rejection of claim 3 under 35 U.S.C. §103(a), as being unpatentable over Koehler, and made the rejection final.

The Examiner has contended that Koehler teaches a mixture of fatty alcohols having an iodine number in the range from 20 to 110, and having from 8 to 22 carbon atom aliphatic chains which may be saturated or unsaturated, and linear or branched. The Examiner has contended that Koehler teaches that it is possible to obtain such fatty alcohols from a palm oil fatty methyl ester and that the iodine value of the fatty alcohols may be adjusted via fractionation prior to hydrogenation.

The Examiner argues that the only differences between the teachings of Koehler and Appellants' claimed invention are the range of carbon chain length and the iodine value range of the products. The Examiner argues that it would have been obvious to one of ordinary skill in the art to obtain fatty alcohols in accordance with the claimed invention based on the process taught by Koehler. The Examiner has also responded that Appellants' previous arguments during prosecution have been directed to the inventive process, not the product-by-process claim which stands rejected. In Paper No. 14, the Examiner again maintains the rejection.

On these bases, the Examiner insists that Appellants' claimed invention is rendered obvious by the Koehler reference.

B. *Appellants' Traversal*

Appellants respectfully traversed the Examiner's rejection in the Request for Reconsideration After Final, and initially in Appellants' Request for Reconsideration, filed on July 15, 2002, in response to Paper No. 7

Appellants again strenuously, but respectfully, traverse the Examiner's rejection and the contentions and arguments in support thereof, for the reasons set forth below.

C. *Law Regarding Prima Facie Obviousness & Product-by-Process Claims*

It is well-settled that in order for an Examiner to establish a case of *prima facie* obviousness based upon a single reference, and thus shift the burden of proving non-obviousness onto Appellants, each of the following three criteria MUST be established: (1) the reference must contain a teaching or suggestion which would motivate one of ordinary skill in the art to modify the reference as suggested by the Examiner (it is not sufficient to say that the reference can be modified without a teaching in the cited reference to suggest the desirability of such a modification); (2) there must be a reasonable expectation of success; and (3) the reference must teach or suggest each and every element of Appellants' claimed invention. (*See,* M.P.E.P. §2143).

Where product-by-process claims are concerned, it has been held that the Examiner must provide a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, before the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. (*See,* M.P.E.P. §2113, citing *In re Marosi,* 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983)).

It is also fairly well-settled that, "even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. If the product in a product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." (*See, In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)).

D. *Lack of Prima Facie Obviousness:*

The Examiner has repeatedly contended that Koehler teaches a mixture of fatty alcohols having an iodine number in the range from 20 to 110 and having from 8 to 22 carbon atom aliphatic chains which may be saturated or unsaturated. The Examiner has also stated that Koehler teaches mixtures with carbon chain lengths of 16 to 18 carbon atoms as the principle constituents. On this basis, the Examiner has argued that the claimed mixture of fatty alcohols is obvious.

Appellants respectfully submit that the Examiner has not provided sufficient rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, and thus has failed to establish a *prima facie* case of obviousness. The Examiner's position has been limited to arguing that the iodine values taught by Koehler and the range of carbon chain lengths taught by Koehler overlap with the claimed mixtures. In other words, the Examiner has argued that the carbon chain *length* taught by Koehler *can* be from 8 to 22 carbon atoms, and that the carbon chain *length* of the claimed invention *can* be from 14 to 20 carbon atoms, without addressing the carbon chain distribution resulting from the claimed process steps.

The claimed invention is directed to a *mixture* of fatty alcohols prepared by a process in accordance with the claimed invention. The Examiner has repeatedly pointed out to Appellants that process limitations do not impart patentability to a product-by-process claim. Appellants do not dispute this facet of the law. *Appellants submit that the process recited in the claim on appeal produces a product (i.e., a mixture of fatty alcohols) which is* ***different*** *than the mixtures taught by Koehler.* Further, the Examiner has not provided a rationale to show that the processes produce the same product with the same iodine values and carbon chain distribution.

Appellants have previously indicated that the mixtures of fatty alcohols according to the claimed invention have both an iodine value and alkyl chain *distribution* which is different than the mixtures taught by Koehler because of the process employed in the claimed invention.

While Appellants recognize that the process limitations do not impart patentability to the product-by-process claim on appeal, it may be helpful to review the differences between the process according to the present invention and the process taught by

Koehler, and why each produces a different product. Additionally, Appellants emphasize that the Examiner has indicated that the claimed process is novel and unobvious.

The process of the present invention includes two steps. First, palm oil fatty acid methyl esters are fractionated to produce a first methyl ester fraction comprised substantially of saturated C_{16} esters and a bottom product which is a second methyl ester fraction comprised substantially of unsaturated $C_{16/18}$ esters. In a second step (b), the bottom fraction is hydrogenated to give the corresponding alcohols under conditions such that the carbon-carbon double bonds remain intact. *In contrast, Koehler does not teach or suggest a fractionation prior to hydrogenation wherein saturated species and unsaturated species are separated.*

Koehler teaches that a $C_{12/18}$ palm kernel (*i.e.*, nut) oil methyl ester, which is already the product of a first fractionation, can be further fractionated to a $C_{12/14}$ and a $C_{16/18}$ methyl ester fraction. The $C_{16/18}$ fraction is then hydrogenated to produce the alcohols, and subsequently distilled, or further fractionated, to remove a head fraction, thus increasing the unsaturated content. (*See,* Koehler, col. 3, lines 39-35 and Example 1, col. 4, lines 38-41). The resulting product obtained via the process taught by Koehler has an iodine value of 61.3. (*See,* Koehler, col. 4, line 58). Only through further distillation, (*see,* Example 2), is the iodine value raised to about 75. Example 3 of Koehler avoids a second distillation by altering the starting materials to include rapeseed oil, as opposed to simply using palm oil derived species. However, a different starting material will also alter the profile of fatty alkyl chains present in the final product.

It is only through the subsequent distillation, and removal of some portion of the hydrogenation product, that the iodine values presently claimed can be achieved via the process of Koehler, using palm oil starting materials. Koehler's only other alternative is to use an entirely different starting material selected to have a higher unsaturated content. Ultimately, the removal of some portion of the hydrogenation product alters the content of the final alcohol mixture. Each subsequent distillation to remove saturated head fractions can potentially increase or decrease the content of any one or more particular fatty alcohols present in the product.

The Examiner has not provided a rationale showing how the two different processes can produce the same or similar alkyl chain distribution. The Examiner has only stated that the range of carbon chain lengths overlaps. Appellants respectfully submit that this is insufficient.

Koehler fails to teach or suggest the simplified process according to the claimed invention, whereby a fraction of methyl esters obtained from palm oil fatty acid is first separated into saturated and unsaturated fractions prior to hydrogenation. The process according to the present invention produces a product different than the prior art.

There is no teaching or suggestion contained in the Koehler reference which would motivate one of ordinary skill in the art to modify its teachings in order to arrive at the claimed invention. Koehler specifically discusses the increase of the product's iodine value via subsequent distillation, and makes no mention of separation prior to hydrogenation. One would be required to deviate from the express teachings of Koehler to arrive at the claimed invention. Moreover, given that Koehler fails to teach or suggest the steps of the claimed process, and given that Koehler contains no teaching or suggestion to make such a modification, it cannot be said that one of ordinary skill in the art would reasonably expect to succeed in such a deviation from the teachings of Koehler. In order to produce mixtures of fatty alcohols according to the claimed invention, one would be required to depart from the teachings of Koehler as described above. Such a departure from the teachings of the reference cannot be said to be obvious.

Accordingly, Appellants submit that the Examiner has failed to establish a *prima facie* case of obviousness, as no rationale tending to show that the claimed product is the same as the prior art product has been provided, nor have the three criteria necessary to establish a *prima facie* case of obviousness been satisfied. Thus, Appellants respectfully request reversal of the Examiner by the Honorable Board and withdrawal of the rejection under 35 U.S.C. §103(a).

E. *Rebuttal of the Alleged Prima Facie Case of Obviousness:*

Even if it were assumed, for argument's sake, that a *prima facie* case of obviousness had been established based upon the Koehler reference, Appellants have shown that the claimed product is different than the prior art product taught by Koehler.

First, Appellants have shown that the process used by Koehler is not the same as the process recited in the claim on appeal. Second, Appellants have explained that the process of Koehler and the process recited in the claim on appeal produce different products. Finally, a comparison of the products of the present invention, for example, as set forth in Table 1 of Appellants' Specification, with the products of Koehler, for example as set forth in Examples 1, 2 and 3 of Koehler, reveals the differences between the two. (*See,* Appellants' Specification, p. 7, & Koehler, cols. 4-6).

Again, the process of the present invention is different from the process of Koehler. The Examiner has acknowledged this and has allowed claim 4 in the instant application on appeal.

The differences between the two processes result in different alcohol mixtures. The fatty alcohol mixtures prepared by the process according to the present invention generally contain over about 60% oleic alcohol, which is an 18-carbon alcohol having a single carbon-carbon unsaturation. (*See,* Appellants' Specification, p. 7). The total content of 18-carbon alcohols is generally well over about 70 to 75 % when the mixtures are prepared by the process according to the present invention. (*See, id.*). As can be seen from Table 1 of Appellants' Specification, the total percentage of 18-carbon atom alcohols, including saturated stearyl alcohol, and unsaturated olelyl, linoleyl and linolenyl alcohols, is almost 80% by weight. (*See, id.*). Moreover, the percentage content of conjugated unsaturations in the fatty alcohol mixtures prepared according to the process of the present invention is over about 6%. (*See, id.*). Finally, the fatty alcohol mixtures prepared according to the process of the present invention generally contain about 18% of 16-carbon atom alcohols.

In contrast, the two mixtures of fatty alcohols based on palm oil-derived starting materials exemplified by Koehler, both contain less conjugated unsaturations, and either less unsaturated C_{18} alcohol, or less C_{16} alcohol. Example 2 of Koehler, which includes a distillation subsequent to hydrogenation in order to achieve an iodine value in the range according to the claimed invention, has a decreased amount of 16-carbon alcohol.

It can be seen from this comparison of the mixtures according to the present invention and the mixtures exemplified in Koehler that the two processes produce different products.

Accordingly, Appellants submit that any alleged *prima facie* case of obviousness has been rebutted and that the claimed product is different than the prior art. Thus, Appellants respectfully request reversal of the Examiner by the Honorable Board and withdrawal of the rejection under 35 U.S.C. §103(a).

CONCLUSION

In view of the arguments set forth above, Appellants submit that the Examiner's rejection under 35 U.S.C. §103(a) is improper in that the Examiner has failed to establish a *prima facie* case of obviousness, and that the claim on appeal patentably distinguishes over the prior art of record and known to Appellants, either alone or in combination. Accordingly, Appellants respectfully request that the Board find for Appellants and reverse the Examiner's final rejection.

Respectfully submitted,

STEPHAN HECK, *et al.*

July 18, 2003
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APPENDIX A

Claims Pending in the Instant Application On Appeal:

3. The product of the process for the preparation of a mixture of fatty alcohols having an iodine number in the range from 65 to 85 of the formula (I)

$$R^1OH \qquad (I)$$

wherein R^1 is a saturated or unsaturated, linear or branched radical having from 14 to 20 carbon atoms, wherein the process comprises the steps of:

(a) fractionating palm oil fatty acid methyl esters to produce a first methyl ester fraction comprised substantially of saturated C_{16} esters and a bottom product which is a second methyl ester fraction comprised substantially of unsaturated $C_{16/18}$ esters, and

(b) hydrogenating the bottom fraction to give the corresponding alcohols under conditions such that the carbon-carbon double bonds remain intact.

4. A process for the preparation of a mixture of fatty alcohols having an iodine number in the range from 65 to 85 of the formula (I)

$$R^1OH \qquad (I)$$

wherein R^1 is a saturated or unsaturated, linear or branched radical having from 14 to 20 carbon atoms, wherein the process comprises the steps of:

(a) fractionating palm oil fatty acid methyl esters to produce a first methyl ester fraction comprised substantially of saturated C_{16} esters and a bottom product which is a second methyl ester fraction comprised substantially of unsaturated $C_{16/18}$ esters, and

(b) hydrogenating the bottom fraction to give the corresponding alcohols under conditions such that the carbon-carbon double bonds remain intact.